CLAIMS

What is claimed is:

1. A network access system, comprising:

an external processor that invokes a policy-based service on received messages; and

a programmable access device having a message interface coupled to said external processor and first and second network interfaces through which packets are communicated with a network, wherein said programmable access device includes a packet header filter and a forwarding table that is utilized to route packets communicated between the first and second network interfaces, wherein said packet header filter identifies messages received at one of the first and second network interfaces on which policy-based services are to be implemented and passes identified messages via the message interface to the external processor for processing.

2. The network access system of Claim 1, and further comprising a policy server coupled to the external processor, wherein said policy server provides policy decisions to the external processor.

3. The network access system of Claim 2, wherein the policy server is a first policy server, and wherein the external processor supports a plurality of policy servers including the first policy server.

4. The network access system of Claim 2, wherein the external processor includes a policy cache that selectively caches policies obtained from the policy server.

5. The network access system of Claim 1, wherein the external processor includes a plurality of service controllers that each implements a respective one of a plurality of services.

6. The network access system of Claim 5, wherein the plurality of service controllers includes primary and secondary service controllers for a particular service, and wherein the secondary service controller provides said particular service to said programmable access device if said primary service controller fails.

7. The network access system of Claim 5, wherein the external processor comprises at least one signaling controller that, responsive to one of said plurality of service controllers, performs network signaling to setup a network connection.

8. The network access system of Claim 1, wherein the programmable access device is a first programmable access device, and wherein the external processor includes a plurality of programmable access device controllers that each control a respective one of a plurality of programmable access devices including said first programmable access device.

9. The network access system of Claim 1, and further comprising a network management server coupled to at least the external processor.

10. The network access system of Claim 9, wherein the network management server includes a billing facility that bills customers in accordance with services implemented by the external processor.

11. The network access system of Claim 1, said programmable access device further comprising a control interface, coupled to the external processor, through which operation of the packet header filter and forwarding table is controlled by the external processor.

12. The network access system of Claim 1, wherein the programmable access device further comprises at least one monitor that gathers statistics regarding network traffic and a reporting interface through which reporting messages related to the statistics are communicated to the external processor.

13. The network access system of Claim 1, wherein the packet header filter filters packets for service processing based upon protocol information pertaining to protocol layers higher than layer 3.

14. The network access system of Claim 1, wherein the programmable access device further comprises a policer that polices packets by reference to traffic parameters.

15. The network access system of Claim 14, wherein the policer comprises a marker that marks packets that do not conform with the traffic parameters.

16. The network access system of Claim 1, said programmable access device further comprising one or more output buffers and a scheduler that schedules the transmission of outgoing packets within the one or more output buffers to support multiple quality of service classes.

17. The network access system of Claim 1, and further comprising an access router coupled to the second network interface of the programmable access device.

18. The network access system of Claim 17, and further comprising a switched access network coupling said access router and the second network interface of the programmable access device.

19. A network comprising:

a network access system in accordance with Claim 17;

at least one core router coupled to the access router; and

a core communication link coupled to the core router.

20. A network access system, comprising:

a policy decision point;

an external processor that invokes a policy-based service on received messages by reference to the policy decision point;

a programmable access device having a message interface coupled to said external processor and first and second network interfaces through which packets are communicated with a network, wherein said programmable access device includes a packet header filter and a forwarding table that is utilized to route packets communicated between the first and second network interfaces, wherein said packet header filter identifies messages received at one of the first and second network interfaces on which policy-based services are to be implemented and passes identified messages via the message interface to the external processor for processing; and

an access router coupled between the programmable access device and network core.

21. A network access method, comprising:

in response to receiving a series of packet at a first network interface of a programmable access device, filtering the series of packets at the programmable access device to identify messages upon which policy-based services are to be implemented;

passing identified messages to an external processor;

performing service processing on identified messages at said service processor; and

for messages that are not identified, routing packets by reference to a forwarding table in the programmable access device and outputting the routed packets at a second network interface of the programmable access device.

22. The network access method of Claim 21, and further comprising communicating policy decisions to the external processor from a policy server coupled to the external processor.

23. The network access method of Claim 22, wherein the policy server is a first policy server, and the method further comprises coupling a plurality of policy servers including the first policy server to the external processor.

24. The network access method of Claim 22, wherein the external processor includes a policy cache, and wherein the method further comprises selectively caching policies obtained from the policy server in the policy cache.

25. The network access method of Claim 21, wherein the external processor includes a plurality of service controllers, and wherein the method further comprises implementing a respective one of a plurality of services with each of the plurality of service controllers.

26. The network access method of Claim 25, wherein the plurality of service controllers includes primary and secondary service controllers for a particular service, and wherein the method further comprises providing said particular service to said programmable access device utilizing said secondary service controller if said primary service controller fails.

27. The network access method of Claim 25, wherein the external processor comprises at least one signaling controller, wherein the method further comprises performing network signaling to setup a network connection utilizing the at least one signaling controller.

28. The network access method of Claim 21, wherein the programmable access device is a first programmable access device and the external processor includes a plurality of programmable access device controllers, said method further comprising controlling each of a plurality of programmable access devices including said first programmable access device with a respective one of said plurality of programmable access device controllers.

29. The network access method of Claim 21, and further comprising coupling a network management server at least the external processor.

30. The network access method of Claim 29, and further comprising billing customers in accordance with services implemented by the external processor utilizing a billing facility of the network management server.

31. The network access method of Claim 21, said programmable access device further comprising a control interface coupled to the external processor, said method further comprising coupling the control interface to the external processor and controlling operation of the packet header filter by the external processor through the control interface.

32. The network access method of Claim 21, wherein the programmable access device further comprises at least one monitor, said method further comprising gathering statistics regarding network traffic utilizing the at least one monitor and communicating reporting messages related to the statistics to the external processor via a reporting interface.

33. The network access method of Claim 21, wherein filtering comprises filtering packets for service processing based upon protocol information pertaining to protocol layers higher than layer 3.

34. The network access method of Claim 21, wherein the programmable access device further comprises a policer and said method further comprises policing packets by reference to traffic parameters.

35. The network access method of Claim 34, wherein the policer comprises a marker and said method further comprises marking packets that do not conform with the traffic parameters.

36. The network access method of Claim 21, said programmable access device further comprising one or more output buffers and a scheduler, wherein the method further comprises scheduling the transmission of outgoing packets within the one or more output buffers to support multiple quality of service classes.

37. The network access method of Claim 21, and further comprising coupling an access router to the second network interface of the programmable access device and transmitting network traffic from the programmable access device to the access router.

38. The network access method of Claim 37, wherein coupling said access router comprises coupling said access router to the second network interface of the programmable access device with a switched access network.

39. The network access method of Claim 21, wherein passing messages to the external processor comprises passing messages via an intermediate network.